

Application No 10/594,157

Response to Office action mailed March 31, 2010

**In the Claims:**

Please AMEND the claims as follows:

Claims

1. (Currently amended) Apparatus for mobilizing drill cuttings in a well, the apparatus comprising a sleeve axially split along at least one side thereof whereby it is adapted to be opened to fit around a drill string in the well, and to be closed around the drill string and clamped thereon to secure the sleeve to the drill string, at least one vane provided on the sleeve, the sleeve having a bearing region, at least one bushing that is rotatably mounted on the bearing region of the sleeve, at least two blades mounted on the bushing, the at least two blades defining at least one fluid conduit between adjacent blades, the blades and vane being rotatable relative to one another.

2. (Previously presented) The apparatus according to claim 1, wherein the blades are configured to create a pressure difference in a fluid flowing through the at least one fluid conduit.

3. (Cancelled)

4. (Cancelled)

5. (Previously presented) The apparatus according to claim 1, wherein the blades project radially outward to a greater extent than the at least one vane.

6. (Cancelled)

7. (Previously presented) The apparatus according to claim 1, wherein the sleeve has

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an axis of rotation, and wherein the blades are arranged substantially parallel to the axis of rotation of the sleeve.

8. (Previously presented) The apparatus according to claim 1, wherein the bushing has an axis of rotation and wherein the blades are offset with respect to the axis of rotation of the bushing such that the blades extend helically around the bushing.

9. (Previously presented) The apparatus according to claim 8, wherein the blades are offset at an angle of 3-10 degrees with respect to the axis of rotation of the bushing.

10. (Currently amended) The apparatus according to claim 1, wherein the sleeve is clamped to the drill string by an annular clamp placed around the sleeve to engage an outer surface of the sleeve.

11. (Cancelled)

12. (Cancelled)

13. (Previously presented) The apparatus according to claim 1, wherein the at least one vane is rotationally fixed to a drill string such that rotation of the drill string causes rotation of the at least one vane.

14. (Previously presented) The apparatus according to claim 1, wherein the at least one vane is configured to create thrust when rotated in a fluid.

15. (Previously presented) The apparatus according to claim 1, wherein the blades have an asymmetric profile.

16. (Previously presented) The apparatus according to claim 1, wherein the blades are shaped in the form of foils, so that the fluid conduits defined between adjacent blades on the bushing change in profile between a first end proximal to the drill bit and a second end distal from the drill bit.
17. (Previously presented) The apparatus according to claim 16, wherein the at least one fluid conduit is relatively narrow at the first end proximal to the drill bit and relatively wider towards the other end distal from the drill bit.
18. (Previously presented) The apparatus to claim 1, wherein the blades have a cross section in the form of an hour glass.
19. (Previously presented) The apparatus according to claim 18, wherein the blades are shaped to have a wide root radially inner most adjacent the bushing, a wide top at the radially outermost part of the blade arranged to bear against the borehole wall, and a narrower cutaway portion between the root and top.
20. (Previously presented) The apparatus according to claim 1, wherein the bushing is formed from a rigid material.
21. (Previously presented) The apparatus according to claim 1, wherein the sleeve has an annular body to accommodate a tubular therethrough.
22. (Previously Presented) The apparatus according to claim 21, wherein the annular body has at least one vane integrally formed therewith.

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23. (Previously presented) The apparatus according to a claim 21, wherein the sleeve has at least one vane-receiving recess therein to receive and retain at least one modular vane.

24. (Previously presented) The apparatus according to claim 1, wherein the bushing has blades integrally formed therewith.

25. (Previously presented) The apparatus according to claim 1, wherein the bushing has blade-receiving recesses therein to receive and retain modular blades.

26. (Previously presented) The apparatus according to claim 1, wherein the sleeve has an axis of rotation, and therein the at least one vane lies parallel to the axis of rotation of the sleeve.

27. (Previously presented) The apparatus according to claim 1, wherein the at least one vane is curved so as to scoop fluid from an area surrounding the vanes.

28. (Previously presented) The apparatus according to claim 27, wherein the at least one vane is configured in a sinusoidal shape.

29. (Previously presented) The apparatus according to claim 27, wherein the sleeve has an axis of rotation, and wherein the at least one vane is offset with respect to the axis of rotation of the sleeve such that one end of the at least one vane is circumferentially spaced around the sleeve from the other end.

30. (Previously presented) The apparatus according to claim 29, wherein the blades are offset with respect to an axis of the bushing, and wherein the at least one vane and the

blades are offset in opposite directions.

31. (Previously presented) The apparatus according to claim 1, wherein the at least one vane has a concave surface.

32. (Previously presented) The apparatus according to claim 31, wherein the concave surface is provided on one side of the at least one vane facing the direction of rotation.

33. (Previously presented) The apparatus according to a claim 32, wherein the side of the at least one vane is shaped to have a greater radius of curvature at one end than at another end.

34. (Previously presented) The apparatus according to claim 1, wherein the at least one vane has one or more notches cut away from a radially outermost portion thereof.

35. (Currently Amended) A drill cuttings agitation assembly, comprising a tubular, and apparatus comprising a sleeve axially split along at least one side thereof whereby it is adapted to be opened to fit around the tubular in the well, and to be closed around the tubular and clamped thereon to secure the sleeve to the tubular, at least one vane provided on the sleeve, the sleeve having a bearing region, at least one bushing that is rotatably mounted on the bearing region of the sleeve, at least two blades mounted on the bushing, the at least two blades defining at least one fluid conduit between adjacent blades, wherein the at least one vane and the blades are rotatable relative to one another, and wherein the apparatus is clamped to the tubular.

36. (Currently Amended) A method of agitating drill fluid in an oil or gas well using an apparatus having a sleeve axially split along at least one side thereof whereby it is

adapted to be opened to fit around a drill string in the well, and to be closed around the drill string and clamped thereon to secure the sleeve to the drill string, at least one vane provided on the sleeve, the sleeve having a bearing region, at least one bushing that is rotatably mounted on the bearing region of the sleeve, at least two blades mounted on the bushing, the at least two blades defining at least one fluid conduit between adjacent blades, the method comprising clamping the apparatus to the drill string, rotating the at least one vane relative to the at least two blades, and passing the drill fluid past the at least one vane and the at least two blades.

37. (Previously presented) The method according to claim 36, including configuring the blades to create a pressure difference in fluid flowing through the at least one fluid conduit defined by at least two blades.

38. (Cancelled)

39. (Cancelled)

40. (Previously presented) The method according to claim 36, including mounting and rotationally fixing the at last one vane on a drill string.

41. (Previously presented) The method according to claim 40, including rotating the drill string to rotate the at least one vane, thereby agitating the drill fluid in the environment.

42. (Previously presented) The method according to claim 41, including centralizing the sleeve within a bore in which the drill string is located, by means of the blades.

43. (Previously presented) The apparatus as claimed in claim 1, wherein the sleeve has a bearing region and the bushing is formed as two separate leaves to close around the bearing region of the sleeve.

44. (Currently Amended) Apparatus for mobilizing drill cuttings in a well, the apparatus comprising a sleeve adapted to fit over a drill string in the well, and at least one vane provided on the sleeve, at least two blades mounted on a bushing that is rotatably mounted on the sleeve, wherein the blades define at least one fluid conduit between adjacent blades, the blades and vane being rotatable relative to one another, wherein the sleeve has a bearing region and the bushing closes around the bearing region of the sleeve, wherein the sleeve is axially split along at least one side thereof whereby it is adapted to be opened to fit around the outer surface of the drill string and is adapted to be clamped onto the outer surface of the drill string to rotationally attach the sleeve to the drill string.

45. (Currently Amended) Apparatus for mobilizing drill cuttings in a well, the apparatus comprising a sleeve which is axially split along at least one side thereof whereby it is adapted to fit over a drill string in the well, and at least one vane provided on the sleeve, at least two blades mounted on a bushing that is rotatably mounted on the sleeve, wherein the blades define at least one fluid conduit between adjacent blades, the blades and vane being rotatable relative to one another, wherein the sleeve has a bearing region and the bushing closes around the bearing region of the sleeve, and comprising an annular clamp for attaching the sleeve to the drill string.